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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/552,260	10/05/2005	Ryouichi Shimoi	050340-0193	6538

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EXAMINER	
PARSONS, THOMAS H	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/552,260	SHIMOI ET AL.	
	Examiner	Art Unit	
	THOMAS H. PARSONS	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11 and 19-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11 and 19-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Amendment

This is in response to the Amendment filed 20 June 2008.

(*Previous*) DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-4 **stand** rejected under 35 U.S.C. 102(b) as being anticipated by Johnson (6,124,051).

Claim 1: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

a passage allowing flow of a fluid provided for at least one of the current extraction sections plate and the end plate (Figure 2). See col. 3: 20-col. 9: 5.

The recitation "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the

fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Johnson appears capable of providing the claimed process.

Claim 2: Johnson further discloses that the passage for the fluid is formed between the current extraction plate and the end plate (Figure 2).

Claim 3: Johnson further discloses that the passage being is formed inside at least one of the current extraction plate and the end plate (col. 3: 57-col. 5: 62).

Claim 4: Johnson further discloses that the fluid is cooling water.

3. The rejections of claims 24-26 under 35 U.S.C. 102(b) as being anticipated by Johnson (6,124,051) have been withdrawn in view of Applicants' Amendment.

4. The rejection of claim 27 under 35 U.S.C. 103(a) as being unpatentable over Johnson (6,124,051) as applied to claim 1 above has been withdrawn in view of Applicants' Amendment canceling the claim.

5. Claims 5-11 and 19-23 **stand** under 35 U.S.C. 103(a) as being unpatentable over Johnson (6,124,051) in view of WO 01/48846).

Claim 5: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current

extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

a passage allowing flow of a fluid provided for at least one of the current extraction sections plate and the end plate (Figure 2). See col. 3: 20-col. 9: 5.

The recitation "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Johnson appears capable of providing the claimed process.

Johnson does not disclose a heating device.

WO 01/48846 in Figures 1-3 discloses

a heating device for heating the passage for the fluid (page 16, lines 33-36, page 17, line 24-27, and page 9, line 34 through page 10, line 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the fuel cell of Johnson by incorporating the heating device of WO 01/48846 because WO 01/48846 teaches a heating device that would have provided for the combustion of fuel or oxidant within the reactant or coolant pathways within the stack, thereby increasing the temperature of the stack on start-up or maintaining a desired operating temperature during operation, without requiring an external heating source.

Claim 6: WO '486 further discloses that the fluid is combustible (i.e. hydrogen, which is the same combustible fluid as that instantly disclosed) and the heating device comprises a catalyst applied to the passage (page 9, line 34 through page 10, line 6).

Claim 7: The recitation "wherein the heating device heats the fluid and supplies the heated fluid to the passage" has been considered, and construed as a process limitation that adds no additional structure.

However, WO '486 in Figure 1 further discloses that the heating device (heat exchanger 142 in Figure 1) heats the fluid and supplies the heated fluid to the passage.

Claim 8: WO '486 further discloses that the fluid is combustible (i.e. hydrogen, which is the same combustible fluid as that instantly disclosed) and the heating device comprises an ignition device (page 9, line 34 through page 10, line 6).

Claim 9: The recitation "wherein the heating device heats at least one of the current extraction sections when the fuel cell stack is started up", has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, WO '486 discloses that the heating device heats at least one of the current extraction sections when the fuel cell stack is started up (page 1, lines 7-18)

Claim 10: WO '486 in Figure 1-3 further that the heating device comprises means (page 9, line 34 through page 10, line 6) for combusting cathode gas for the fuel cell stack (page 16, lines 33-36, and page 17, lines 23-26).

The recitation, "the heating device heats at least one of the current extraction sections using the heat of combustion" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

Claim 11: WO '486 in Figures 1-3 disclose that the heating device comprises means for combusting a gaseous mixture of cathode gas and anode gas for the fuel cell stack (page 9, line 34 through page 10, line 6, page 16, lines 33-36, and page 17, lines 23-26).

The recitation, "the heating device heats at least one of the current extraction sections using the heat of combustion" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

Claims 19 and 21: The recitation ", wherein the anode gas is an anode gas discharged from the fuel cell stack" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell system. However, because the fuel cell system of the Johnson combination is structurally similar to that instantly disclosed, it appears capably of providing the claimed process.

In addition, WO '846 discloses, "In the fuel cell power generation systems illustrated in FIGS. 1-3, other conduit and/or valving configurations may be suitable, depending upon the application, provided that at least a portion of the fuel and oxidant streams can be diverted to the coolant pathway". Therefore, it would have been within the skill of one having ordinary skill in the art at the time the invention was made to have modified the valving of the Johnson combination to provide an anode gas discharged from the fuel cell stack.

Claim 20: WO '486 in Figures 1-3 further disclose that the heating device (page 9, line 34 through page 10, line 6) comprises means (121) for supplying anode gas (120) for the fuel cell stack to the current extraction sections after supplying cathode gas (130) for the fuel cell stack to

the current extraction sections and means for combusting the gaseous mixture of anode gas and cathode gas. See also page 16, line 33 through page 17, line 20).

Claim 22: Johnson further discloses that the passage for the fluid is formed between the current extraction plate and the end plate (Figure 2).

Claim 23: Johnson further discloses that the passage being is formed in at least one of the current extraction plate and the end plate (col. 3: 57-col. 5: 62).

Response to Arguments

6. Applicant's arguments filed 20 June 2008 have been fully considered but they are not persuasive.

The Applicants argue "...as regards independent claims 1 and 5, Johnson fails to disclose a passage allowing flow of a fluid during startup of the fuel cell stack at a temperature below freezing, provided for at least one of the current extraction plate and the end plate.

In response, the recitation "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Johnson appears capable of providing the claimed process.

DETAILED ACTION

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson (US 6,124,051).

Claim 24: Johnson in Figures 1-3 discloses a fuel cell assembly comprising:

a fuel cell stack (25) formed by laminating a plurality of cells (15);

plus and minus current extraction sections (bus plates 16, 14), the current extraction sections sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (bus plate 16, 14) which is fixed to an end cell positioned on an end of the fuel cell stack, and an end plate (endplates 18, 17); and

an enclosed cavity at least one of the current extraction sections (i.e. compression plate 17 sealed against bus plate 16 by sealing plate 28, as shown in Figure 1, has been construed as an enclosed cavity). See col. 3: 20-col. 9: 5.

Johnson does not disclose the end plate is formed from a material which has a lower coefficient of thermal conductivity than a material for forming the current extraction plate.

However, one skilled in the art would know that if the endplate has a lower coefficient of thermal conductivity than that of the current extraction plate, heat generated becomes localized,

and can assist in melting frozen water thereby improving overall fuel cell performance and service life.

Claim 25: Johnson further discloses that the enclosed cavity is formed between the current extraction plate and the end plate.

Claim 26: Johnson further discloses that the enclosed cavity being formed inside at least one of the current extraction plate and the end plate (e.g. turnaround grooves 29 in bus plate 14) (see col. 5: 14-62).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4, 5, 7, 9 and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Romanowski et al. (US 5,132,174).

Claim 1: Romanowski et al. in Figures 1-3 disclose a fuel cell assembly comprising:

a fuel cell stack formed by laminating a plurality of cells (4);

plus and minus current extraction sections, the current extraction sections extracting current generated by the fuel cell stack and sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (10) which is fixed to an end cell positioned on an end of the fuel cell stack so as to extract the generated current, and an end plate (12, 14) for uniformly binding the cells of the fuel cell stack;

and a passage (20, 18) allowing flow of a fluid, provided for at least one of the current extraction plate and the end plate. See col. 1: 16-col. 2: 7 and col. 2: 45-col. 3: 60.

The recitation, "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Romanowski et al. appears capable of providing the claimed process. Also, Romanowski et al. on col. 2: 47-60 disclose "…The coolant heater has an auxiliary start-up component which imparts additional heat to the coolant until such time as the stack reaches proper operating temperature, whereupon the auxiliary start-up component of the heater will shut off.

Claim 2: Romanowski et al. in Figure 2 disclose that the passage for the fluid is formed between the current extraction plate (10) and the end plate (12).

Claim 3: Romanowski et al. in Figure 2 that the passage is formed inside at least one of the current extraction plate (10) and the end plate (14).

Claim 4: Romanowski et al. disclose that the fluid is cooling water for cooling the fuel cell stack. In particular, Romanowski et al. discloses a coolant, which has been construed a broadly encompassing a cooling water.

Claim 5: Romanowski et al. in Figures 1-3 disclose a fuel cell system comprising:

a fuel cell assembly comprising;

a fuel cell stack formed by laminating a plurality of cells (4);

plus and minus current extraction sections, the current extraction sections extracting current generated by the fuel cell stack and sandwiching the fuel cell stack with respect to the

direction of lamination, each current extraction section comprising a current extraction plate (10) which is fixed to an end cell positioned on an end of the fuel cell stack so as to extract the generated current, and an end plate (12, 14) for uniformly binding the cells of the fuel cell stack; a passage allowing (20, 18) flow of a fluid; and

a heating device (col. 3: 47-60) for heating the passage for the fluid.

The recitation, "during startup of the fuel cell stack at a temperature below freezing" has been considered, and construed as a process limitation that adds no additional structure to the fuel cell. Further, because the structure of the fuel cell stack and, in particular, the passage of Johnson is structurally the same as that instantly claimed, the passage of Romanowski et al. appears capable of providing the claimed process. Also, Romanowski et al. on col. 2: 47-60 disclose "...The coolant heater has an auxiliary start-up component which imparts additional heat to the coolant until such time as the stack reaches proper operating temperature, whereupon the auxiliary start-up component of the heater will shut off. See col. 1: 16-col. 2: 7 and col. 2: 45-col. 3: 60.

Claim 7: Romanowski et al. disclose the heating device heats the fluid and supplies the heated fluid to the passage (col. 3: 41-60).

Claim 9: Romanowski et al. disclose that the heating device heats at least one of the current extraction sections when the fuel cell stack is started up (col. 3: 41-60).

Claim 22: Romanowski et al. in Figure 2 disclose that the passage (18, 20) for the fluid is formed between the current extraction plate (10) and the end plate (12, 14).

Claim 23: Romanowski in Figure 2 disclose that the wherein the passage (14) is formed in at least one of the current extraction plate(10) and the end plate (14).

Claim 24: Romanowski et al. in Figures 1-3 disclose a fuel cell assembly comprising:

a fuel cell stack formed by laminating a plurality of cells (4);

plus and minus current extraction sections, the current extraction sections extracting current generated by the fuel cell stack and sandwiching the fuel cell stack with respect to the direction of lamination, each current extraction section comprising a current extraction plate (10) which is fixed to an end cell positioned on an end of the fuel cell stack so as to extract the generated current, and an end plate (12, 14) for uniformly binding the cells of the fuel cell stack; and an enclosed cavity (18, 20) for confining fluid therein formed in at least one of the current extraction sections,

wherein the end plate is formed from a material (i.e. thermal and electrical insulating plates 6, 9) which has a lower coefficient of thermal conductivity than a material for forming the current extraction plate. One skilled in the art would know that the current extraction plate would be metal, otherwise there would be no current extraction through the plate.

Claim 24: Romanowski et al. in Figure 2 disclose that each current extraction section comprises a current extraction plate (10) for extracting the generated current and an end plate (12, 14) for uniformly binding the cells of the fuel cell stack, and wherein the enclosed cavity (18, 20) is formed between the current extraction plate and the end plate.

Claim 26: Romanowski et al. in Figure 2 further disclose that each current extraction section comprises a current extraction plate (10) for extracting the generated current and an end plate (12, 14) uniformly binding the cells of the fuel cell stack, the enclosed cavity (18, 20) being formed inside at least one of the current extraction plate and the end plate.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS H. PARSONS whose telephone number is (571)272-1290. The examiner can normally be reached on M-F (7:00-3:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
Supervisory Patent Examiner, Art Unit 1795

Thomas H Parsons
Examiner
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